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Wildlife

IN NORTH CAROL

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TEN CENTS MARCH 1949

The Robin is the traditional symbol of spring. Although many of these birds stay in North Carolina through the winter, they do not begin their beautiful singing until the mating season begins.

ANOTHER CRITICAL PERIOD

We are now entering one of the most critical periods for our wildlife species. The breeding season throughout the spring and summer months will determine how bountiful or how scant next fall's harvest of wildlife species will be. The winter of 1948-49 has been extremely mild. This means that the seed stock of wildlife which carried through the hunting seasons has not been adversely affected by winter mortality. If weather conditions this spring and summer are not severe, the crop of game produced this year will be limited only by the availability of suitable breeding habitat.

WILDLIFE IN NORTH CAROLINA

The Official Publication of The North Carolina Wildlife Resources Commission, Raleigh

A monthly magazine devoted to the protection and restoration of our Wildlife Resources and to the improvement of hunting and fishing in North Carolina

STATE OF NORTH CAROLINA

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March 1949 **Vol. XIII No. 3**

COVER

This unusual illustration by Artist Win Donat depicts one of North Carolina's most important game animals. To make the picture, Donat covered a section of scratch board with black ink and brought out the details by scratching away the ink in appropriate places. The process might be called "Sculpture In Ink."

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Wildlife in North Carolina recognizes the need for close coöperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication all news items, articles, photographs, and other material dealing with the various activities which combine to make North Carolina a better state for hunting and fishing. Full credit is given for all material published.

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The paid circulation of this magazine has increased nearly tenfold since March 1948. We believe that our readers appreciate the necessity of a sound wildlife management program in North Carolina, and that a sound program cannot be successful unless it has the wholehearted support of the public WILDLIFE IN NORTH CAROLINA is one means of obtaining support to the game program. If you enjoy this magazine, tell your friends about it. They may wish to subscribe.

Rod Amundson, *Editor.*

LET'S LEARN ABOUT OUR WILDLIFE

The Second of a Series on Game Birds and Game Mammals of North Carolina

The Gray Squirrel

By Rod Amundson

Nomenclature

The Gray squirrel is so characteristic of the fauna of North Carolina that a scientist named Gmelin honored it and the state with the name *Sciurus carolinensis.* To arrive at the first half of the double-barreled scientific name, taxonomists combined a Greek word *Skia* (shade) with another Greek word *Oura* (tail) which means "Shadetail" and relates to the long bushy tail which is often curled over the back so that the animal is shaded by it. The generic name *Sciurus* applies to at least forty-six other species of tree squirrels in this country, but does not designate eighty different species of closely related ground squirrels or about two dozens of flying squirrel species.

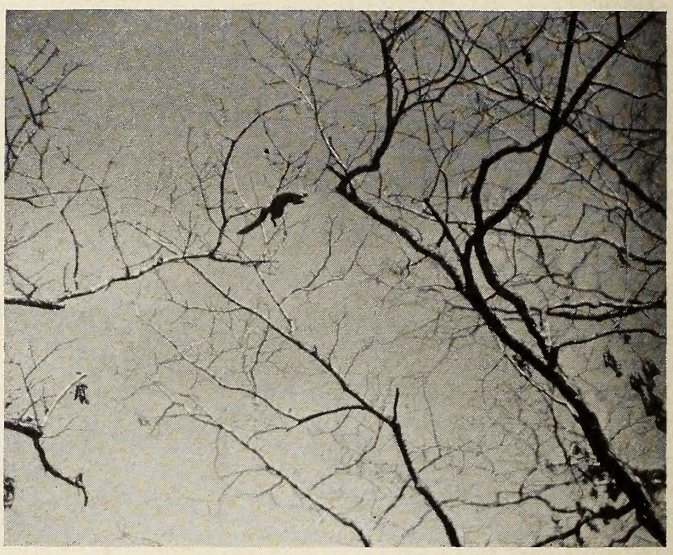
Translated literally, the word *Carolinensis* means "of Carolina." So much for the scientific name of the Carolina gray squirrel. Other common names range from Bannertail and Silvertail in English to the name *Fanitasho* given it by the Choctaw Indians.

History

Like many other game species, the gray squirrel is described by early arrivals in North Carolina as having occurred in "myriads" and "hordes." Although no great attention to accuracy was given by pioneers in their accounts of the wildlife they found in the new land, there is no reason to believe that the gray squirrel did not at one time exist in almost unbelievable numbers. *Sciurus carolinensis* is an inhabitant of dense woodlands, and North Carolina was once an area of primeval forest.

The gray squirrel shares with the American bison the unhappy distinction of having had a rifle designed especially for its slaughter. Squirrel guns hold an important place in the history and literature of Southern states, notably Kentucky.

There is no doubt that the succulence and flavor of the flesh of the gray squirrel played an integral part in the reduction of its numbers in this and other states, but more likely the clearing of land and cutting over of dense forests played a more important role in diminishing gray squirrel populations. Despite the inroads of the woodsman's rifle and axe, the gray squirrel still holds a high place on the list of important game animals throughout the country.



The gray squirrel is an aerial acrobat, and makes fantastic leaps from tree to tree or from a tree to the ground.

Description

The gray squirrel is somewhat smaller than his close relative the fox squirrel. The latter measures about 25 inches from nose to tail tip, with 12 inches of that length devoted to the tail. The gray squirrel is about 19 inches long with a nine inch tail, and weighs about 16 ounces as compared with an average of about 40 ounces for the fox squirrel.

Ernest Thompson Seton, dean of writers on American game animals, describes the gray squirrel with a few deft strokes of the pen which not only pictures the animal, but distinguishes it from the closely related fox squirrel and red squirrel:

"When seen in the tree-tops, its gray (or, in the North, its black) colour and immense, bushy tail are distinguishing marks. From the Fox-squirrel, it is easily told by its smaller size, white under-parts and the white edging of the tail; and from the Red-squirrel, by its greater size, gray colour, and white-edged tail.

"Colour. General colour, pepper-and-salt gray, the underfur being lead colour, and each of the over-hairs leaden at base, then buff, then blackish, and at the tip white; on the head, back, paws, and saddle down the back, the gray is tinged with rusty yellow, The cheeks, muzzle, ears, and upper parts of paws,

are often nearly clear tan or sienna; chin, throat, under-side of legs, and all below, clear white. The long tail hairs are of the same style as those on the body, i. e., basal half, tan; next quarter, black; tip, white."

As with many other wildlife forms, there are color phases of the gray squirrel which may lead to confusion of the unpracticed observer. There is a black or melanistic phase, but this color variation rarely occurs in North Carolina. The same phenomenon occurs in the fox squirrel, but differences in size should make it easy to distinguish between melanistic mutants of the two species.

Behavior

It is possible that the gray squirrel, along with his arboreal cousins, plants more oak trees incidentally to his daily routine of seeking and hoarding food than man ever plants intentionally. Unlike other types, he does not frequently store up large supplies of acorns and other nuts in hollow trees. He prefers to bury a nut here and there in the soft earth of the forest floor. Despite a rather uncanny ability to retrieve buried nuts—even when the ground is covered with snow—he probably leaves as much as half his hidden store when it can germinate and grow.

Although nuts of various kinds are a major item of the gray squirrel's diet, he can subsist on the buds of trees during spring months when nuts are scarce, and will even gnaw into the cambium layer of trees to lick up the flow of sap. Despite his classification as a strict vegetarian, the gray squirrel may at times develop an appetite for the eggs and even the flesh of birds. Such deviations from the normal are too rare to give the gray a bad name.

In general manner, the gray is a shy and peaceful citizen. He must be constantly alert for natural enemies, and is an expert at making himself "scarce" among the branches and limbs of a tree. Something of an aerial acrobat, the gray squirrel will not hesitate in time of danger to make fantastic leaps from treetops to the ground. Wide-spread legs and bushy tail serve to land him without injury, and his ability as a ground-runner takes him quickly to a neighboring tree. His protective coloring, his ability to get on the "off" side of a limb, and his ability to lie motionless along a limb for long periods of time make him a difficult target for hunters.

Despite his reputation for shyness, the gray squirrel can be tamed, and often becomes an affectionate pet. He is especially tame in city parks. People frequently take young grays from the nest and raise them on cow's milk fed with an eye-dropper. There have been a number of instances of house-cats adopting baby squirrels and raising them to maturity.

Although gray squirrels cannot be classed as migratory in the usual sense of the word, there are numerous instances of migrations ranging from local movements to mass exodous of thousands of individuals.

The most spectacular migrations occurred many years ago, but local migrations still occur when mast crop failures cause the animals to seek more fruitful habitat. George Jarrett, Law Enforcement Supervisor of Wildlife Resources Commission District 9, reports that in 1946 he saw literally hundreds of gray squirrels voluntarily swimming across Lake Hiwassee after a failure of the mast crop on one side of the lake.

Gray squirrels do not hibernate, but during severe winter weather they may stay in their nests or den trees for several days at the time.

Breeding

The breeding habits of the gray squirrel in North Carolina are so closely integrated with the management (setting the seasons) of the species that the subject will be further discussed under the heading *Management*. In general, the mating season begins in the early spring and continues for a period of time varying with the northern and southern limits of the range. In North Carolina there is still inadequate information regarding the breeding period of the gray squirrel to enable game managers to set the season for fall shooting toward the best interests of the species.

Gray squirrels are polygamous. The gestation period is of about forty-four days duration, and the first litter may appear during January or February in this state. There are generally from two to four young per litter, with exceptions at both extremes. Winter and early spring litters are likely to be born in hollow trees, whereas subsequent litters will be born in nests. Nests of the gray squirrel are usually placed in crotches of trees, and resemble the somewhat haphazard efforts of crows or hawks where construction is concerned. They are made of leaves, bark

The gray squirrel is a friendly animal, and becomes quite tame in city parks.

fibers, and other materials. An elaboration on crow and hawk nests, however, is an over-all roof which keeps the young warm and dry. Access to the nest is gained through a hole in the side.

Gray squirrels are born blind, naked, and helpless, being almost fetal in appearance. Six weeks see them out of the nest to explore their surroundings, and in eight or ten weeks they have been weaned and can take regular food. About twelve months bring the young to maturity, but they do not reach maximum size until two years have elapsed.

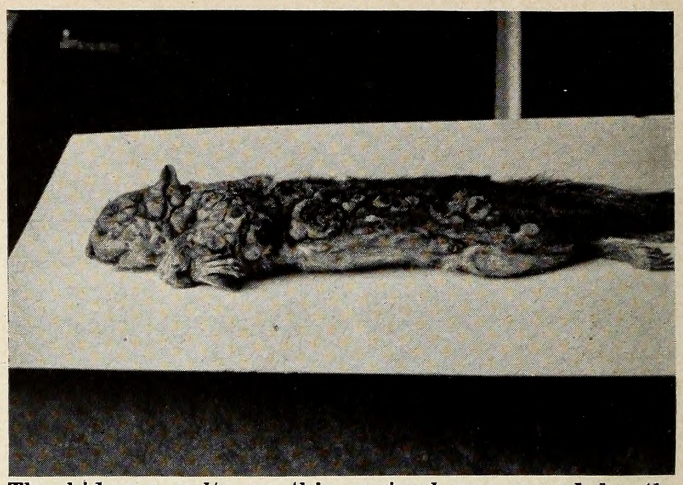
Enemies

A number of birds and animals prey on the gray squirrel. Several species of hawks and owls include them in their diet. Crows make much to do over squirrels at times, but there is little evidence to show that they actually destroy them.

Weasels are the most important mammalian predator of squirrels. Minks, foxes, and wildcats take their toll.

Sharp claws are adapted to grasping the bark of trees. The gray squirrel can run up or down a tree with apparent ease.

Perhaps the greatest scourge of the gray squirrel is the botfly warble, locally called "wolves." Infestations of these repulsive larvae make the flesh of squirrels undesirable to hunters, who, when killing an infested squirrel in early fall, almost invariably throw the dead animal away as unfit for food. Botfly warble infestations are a factor which must be considered in setting early fall shooting seasons.



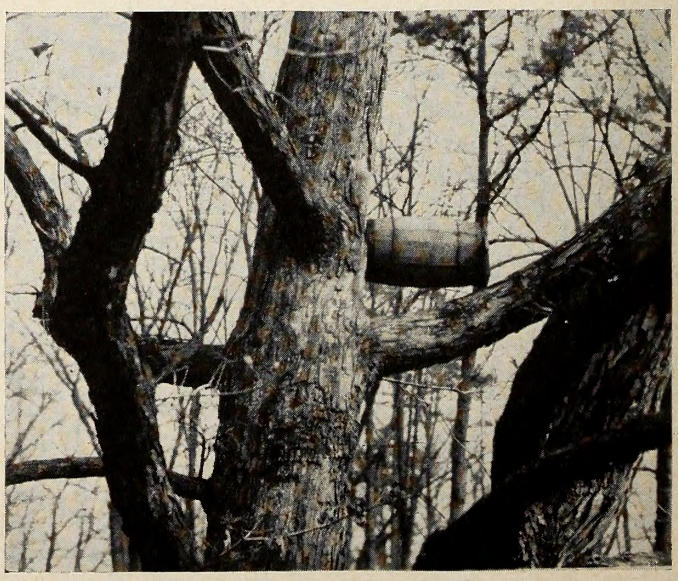
The hideous welts on this squirrel are caused by the larvae of a large fly. The parasite is locally called "Wolves."

The red squirrel, or "boomer" as it is often called, has been considered by many as the arch-enemy of the gray squirrel. Although much smaller than the gray, the boomer is extremely pugnacious and does not hesitate to attack his larger cousin. There are frequent reports that red squirrels practice a habit of deliberately castrating gray males. It is known that red squirrels do seize the scrotums of gray squirrels and tear them open. Whether this act is a deliberate effort at castration is highly doubtful.

Management

Although not as prolific as the cottontail rabbit, the gray squirrel is able to reproduce his kind to such an extent that there is little danger of a drastic shortage occurring in the forseeable future. There are, of course, population fluctuations ranging from abundance to relative scarcity. The gray's dependence on forest mast makes him susceptible to mast crop failures, and successive years of mast crop failure can cause local shortages of the species.

(Continued on page sixteen)



Simple devices like this nail keg provide homes for gray squirrels as an inexpensive management measure.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

HUNTERS AND TRAPPERS ARE REMINDED THAT THE SEASONS ON ALL GAME AND FUR BEARING ANIMALS CLOSED WITH THE EXPIRATION OF THE SEASONS ON MINK, MUSKRAT, OPOSSUM AND RACOONS IN SOME EASTERN COUNTIES.

* * * * *

THE WILDLIFE RESOURCES COMMISSION HAS GIVEN THE GO-AHEAD SIGNAL ON CONSTRUCTION OF A NEW HATCHERY BUILDING AT THE MARION HATCHERY, SUBJECT TO FINAL APPROVAL BY THE BUDGET BUREAU.

* * * * *

THE NEWLY-RENOVATED FISH HATCHERY AT MARION IS NOW IN PRODUCTION, WITH A NUMBER OF TROUT BEING REARED THIS YEAR.

* * * * *

FISH PRODUCTION IN STATE-OWNED HATCHERIES WILL BE AUGUMENTED THIS YEAR BY MORE THAN 300,000 TROUT EGGS SECURED WITHOUT COST FROM FEDERAL HATCHERIES, AND 18,594 TROUT FINGERLINGS FROM THE SAME SOURCE. TROUT ARE BY FAR THE MOST EXPENSIVE TYPE OF FISH PRODUCED IN HATCHERIES IN THIS STATE, AND THE FEDERAL EGGS AND FINGERLINGS ARE A WELCOME ADDITION TO THE TOTAL PRODUCTION.

* * * * *

TWO-WAY RADIO EQUIPMENT FOR THE WILDLIFE RESOURCES COMMISSION'S PATROL PLANE AND WILDLIFE PATROL CARS IS NOW IN THE PROCESS OF BEING INSTALLED. WHEN THE LAW ENFORCEMENT DIVISION HAS COMPLETED INSTALLATION OF RADIO EQUIPMENT THE PATROL PLANE WILL BE ENABLED TO COMMUNICATE WITH A STATE-WIDE RADIO NETWORK OF THE NORTH CAROLINA HIGHWAY PATROL. THE WILDLIFE COMMISSION HAS BEEN RECEIVING EXCELLENT COOPERATION WITH THE HIGHWAY PATROL, AND RADIO COMMUNICATION WILL MAKE THIS COOPERATION RECIPROCALLY BENEFICIAL ——AND MAKE OPERATIONS EXTREMELY HAZARDOUS FOR FISH AND GAME LAW VIOLATORS.

* * * * *

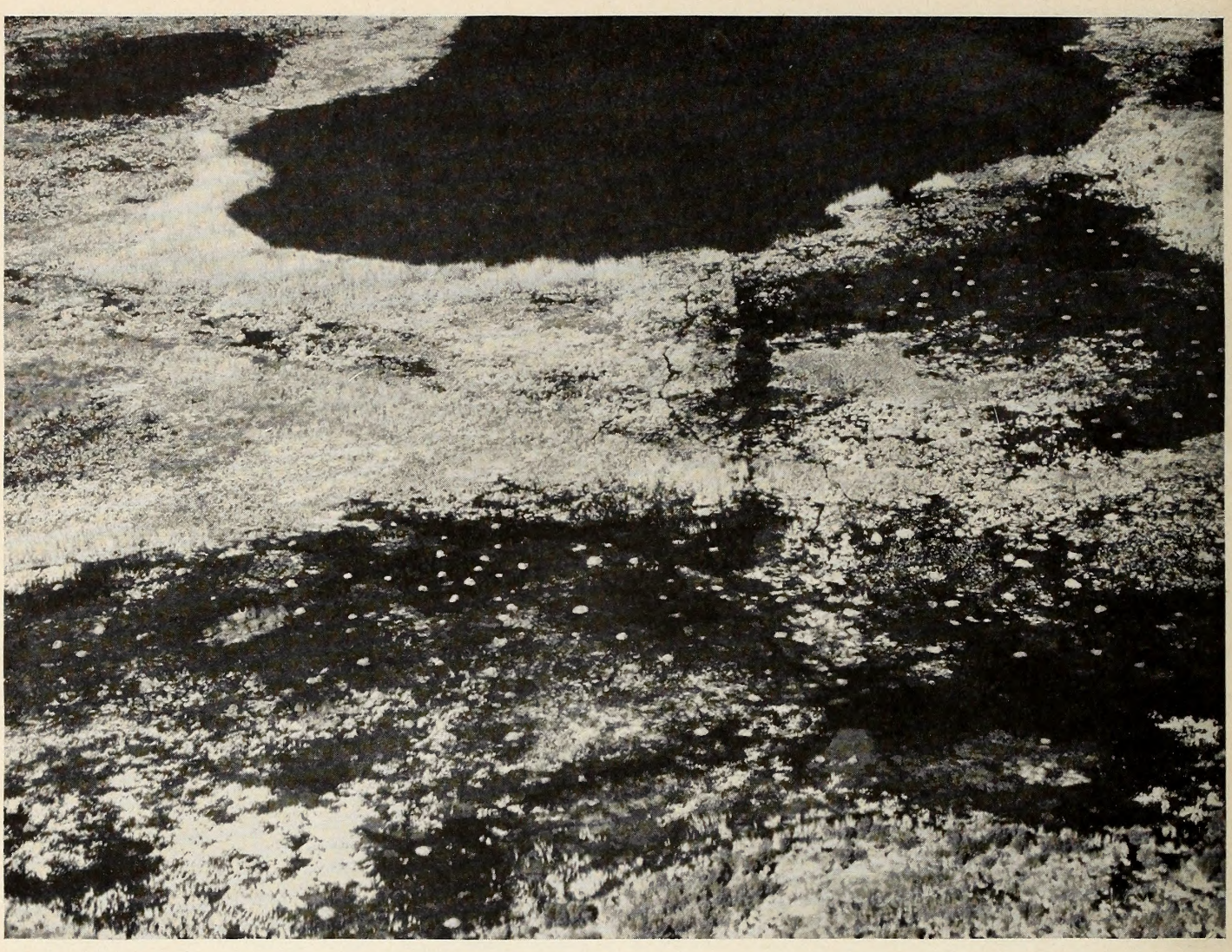
A NEW RADIO STATION HAS BEEN ADDED TO THE GROUP FEATURING THE COMMISSION'S RADIO PROGRAM "THE TARHEEL WILDLIFE REVIEW." RADIO STATION WIRC AT HICKORY BEGAN AIRING THE PROGRAM REGULARLY ON SATURDAYS ON FEBRUARY 19 AS A PUBLIC SERVICE FEATURE.

* * * * *

REPORTS COMING IN FROM EASTERN WATERS INDICATE THAT ROCKFISH BEGAN RUNNING IN FEBRUARY WITH SPORTSMEN GETTING FAIR CATCHES AS EARLY AS FEBRUARY 10.

* * * * *

SEVERAL MEMBERS OF THE WILDLIFE COMMISSION'S EXECUTIVE AND ADMINISTRATIONAL STAFF WILL ATTEND THE NORTH AMERICAN WILDLIFE CONFERENCE IN WASHINGTON, D. C. ON MARCH 7, 8, AND 9. THE NORTH AMERICAN IS THE OUTSTANDING GET-TOGETHER OF GAME MANAGERS AND CONSERVATIONISTS OF THE COUNTRY. THE CONFERENCE IS OPEN TO ALL PERSONS INTERESTED IN WILDLIFE MANAGEMENT.



An aerial view of muskrat houses on a 15-acre segment of marsh on the Outer Banks. Muskrat marshes are an important source of income to Tarheel trappers.

NORTH CAROLINA'S FUR RESOURCES

By Kenneth Wilson
Project Leader Marsh Resources (Photos by the Author)

Ask 'most any North Carolinian what farm crop brings the biggest income and he will tell you tobacco. Ask any sportsman what popular game bird roosts on the ground in a compact circle every fall and winter night and he'll answer, unhesitatingly, "bobwhite quail." But ask any ten men or women on the street a few simple questions about the wild fur animals of North Carolina and I'll wager the correct answers will be few and far between. What are the principal fur animals of the State? Where are the greatest concentrations? What is the value of the fur resources? Can the fur supply be increased by good management? Most people don't know because they have never been told. Some folks aren't interested anyway. But if you are a Dad who just dug five hundred dollars from your "jeans" for the wife's new fur coat, you'll be interested. The 20 per cent excise tax that you paid, though hard on the pocketbook, was simple enough to understand. But why all the cost for the pelts of a few dozen muskrats sewed together into a coat? You wonder where they came from and what the trapper received. You wonder what it cost the garment manufacturer to make the coat and his margin of profit. You wonder many things and then you become confused and conclude that it's too long a story. And it is a long story.

In North Carolina the story of fur and the drama of young America in the making started 365 years ago when two barks sent out from England by Sir Walter Raleigh dropped anchor in Roanoke Sound in July 1584. Friendly relations with the Indians soon turned to brisk trading of deer skins and furs. All along the coast there were large numbers of otters which were taken by "weares and other

engines."[1] For good profit. Later coastal trading was done with the pelts of fur animals and reference is made to beaver traders sailing through Currituck Inlet (now closed) down Currituck Sound to Roanoke Island. In 1663 when the Province of Carolina was granted to eight noblemen by Charles II, it was a vast storehouse of virgin resources. The northern portion of the grant, today North Carolina, was cut coastally by three great inland sounds, Currituck, Albemarle and Pamlico—the tidelands of which teemed with wild fowl, muskrat, beaver and mink[2]. As in every other part of North America the fur trade had a profound influence on the successful colonization of the Tarheel State. For years the pelt of the beaver was regarded as legal tender among the frontiersmen. On occasions serious inter-colonial disputes developed over the fur trade between North Carolina and the surrounding colonies; however the valuable peltries that caused these differences likewise provided the critically needed warmth that kept the hardy colonists and their families alive through the winter. But the fur that was a necessity in pioneer days is considered a luxury today. Nations and people have accumulated vast wealth from this great natural resource without giving a thought to the day when the supply would become exhausted. Today the common wild fur-bearers are not in danger of extinction but many of the finer fur animals have been reduced so low that supplies for the fur trade are negligible and some species are threatened with extinction.[3]

While North Carolina does not rank with Louisiana, Texas, Minnesota and Michigan in wild fur animal production, it does produce between one-half and three quarters of a million dollars worth of fur annually. Most of this money goes to farmers and farm boys. Except for the considerable energy expended in trapping the furry tenants of the land, the effort of growing the crop is nothing. In this day of high living costs and high taxes it must be of considerable satisfaction to the farmer to know that the mink and muskrat growing upon the back acres of his farm represent sufficient cash when caught to pay the taxes on his property.

But the trappers' and fur traders' lot isn't so rosy as it might appear. It is true that today the United States does not produce enough furs to meet more than half its own demand and that twice as many foreign as domestic furs are now consumed, however, there is more to the story than that. During the past twenty years milady's tastes have changed and so have the fur coat styles. The long-haired furs which were once so popular no longer have any appeal. Dismal Swamp raccoons that once brought eight dollars now are worth only one dollar. Red foxes from the Great Smokies that brought fifteen dollars and up a few years ago now are hard to sell for 75c. Thousands of these animals' peltries are stored in warehouses over the country, where they will remain until Fashion again favors the long-haired fur. Low prices and lessened trapper interest have resulted in smaller harvests of these animals. Each year more brood stock has been left until today in many sections of the State these animals have increased to the point of being pests. Foxes are excellent mousers and a few of them are fine to have around any mouse-infested farm but crafty Reynard also likes rabbits, bobwhite quail, other game and the farmers' chickens, so you can see that too many foxes don't help the sportsmen and poultrymen. Bobby Coon has a lot of commendable habits too, and some people say he washes all his food, but that makes me wonder—does Mr. Raccoon wash all the corn he swipes from the farmer every year? For years Billy Possum's jacket has brought between 30c and 75c, his fur has been always considered the minus quantity in the fur trade but this year the gray fox, a neighbor of his who occasionally eats him, holds that doubtful distinction. Gray foxes that for years brought around $2 now bring only 25c. And as long as coat styles discourage the use of the long-

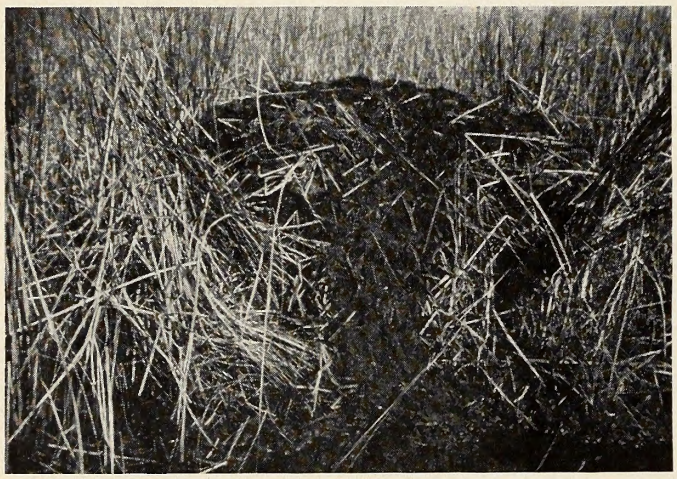
Marsh management means big healthy muskrats and high quality furs. This trap has an extra jaw which prevents animals from breaking off legs and escaping.

[1] McConnaughey Wm. E., "Of Beasts, Birds and Fish," Wildlife In North Carolina, January 1949.

[2] Wager, Paul W. and Hayman, Donald B., *Resource Management In North Carolina,* University of North Carolina Press.

[3] Ashbrook, Frank G., "Fur An Important Wildlife Crop," *Pennsylvania Game News,* July 1948.

The mink is one of the most blood-thirsty of predators, but its fur is one of the most highly prized by the fur industry.



A typical muskrat house. Note the muddy runway on the fore side which is made by inhabitants of the house.

haired furs the pelts of all these animals, the skunk included, will continue to be low.

Study of the fur dealer's report shows the muskrat, raccoon, opossum, mink and gray fox in the order named were numerically the five heaviest trapped fur animals in the State during the 1947-48 trapping season. It is also interesting but discouraging to note that of the eleven animals legal to trap, muskrat and mink last year represented 90 per cent ($414,000) of the total dollar value. Muskrat numbers year after year total more than all the other fur animals combined. Northeastern North Carolina and Currituck County in particular with its 34,000 acres of tidal marsh produces between 60 and 70 per cent of the muskrats in the state. Two forms of muskrat inhabit the state, the common brown muskrat (*Ondatra zibethica zibethica*) and the black muskrat (*Ondatra z. macrodon*) a beautiful subspecies of the former found principally along the coast from Delaware Bay to Pamlico Sound. Though most black 'rats are found in Currituck County some of them according to fur dealers are taken inland as far west as Raleigh. Black muskrats usually bring higher prices than brown 'rats on the New York fur market partly because of their popularity in Europe.

The 1948-49 season started off with muskrats at $1.25 but by mid-January $1.85* was being paid at the Moyock fur shed for best grade 'rats. Last year's prices for this furbearer started at $2 and rose to $3.10. Besides its fur value, the muskrat is considered by many as a palatable and nutritious food. Every winter thousands of carcasses are shipped from northeastern North Carolina to Baltimore, Philadelphia and other cities to the north. This year's 30 cents per muskrat has not yet matched last year's unprecedented wholesale price of 40 cents per animal. People who do not know the clean habits of the muskrat are inclined to turn up their noses when it is mentioned as food. The word "rat" reminds them of the filthy little beast that is found by the thousands in practically every city and town in the U. S. and they want nothing to do with any of its relatives. Folks not bothered by names, however, find the muskrat a tender, tasty food and quite a bit like black duck. The writer has eaten muskrats from Maryland and liked them but for flavor they cannot compare to a Currituck County specimen reared on the tender roots of three square grass (*Scirpus olneyi*).

FUR DEALERS' REPORT OF WILD FUR ANIMALS TRAPPED DURING 1947-48 SEASON IN N. C.*

Fur Animal	Number	Average Value of Pelt	Total Value
Muskrat	105,406	$ 2.25	$237,163.50
Raccoon	26,768	.75	20,076.00
Opossum	14,956	.30	4,486.80
Mink	11,800	15.00	177,000.00
Otter	801	20.00	16,020.00
Weasel	797	1.25	996.25
Skunk	883	1.10	971.03
Civet	36	.75	27.00
Gray Fox	3,555	.50	1,777.50
Red Fox	114	.75	85.50
Wildcat	44	1.00	44.00
Total Value			$458,647.85

Best quality minks, according to fur dealers, come from the Great Smoky Mountains. Coastal Plain minks are more plentiful and usually darker brown but their fur lacks the luster and they are smaller. Eastern Carolina minks (*Mustela vison mink*) are popular in the Old World, however, and before World War II the majority went to France. Though red foxes are not so plentiful as in states northward, some of the most beautiful cherry-red specimens in the

* Based on 100 per cent returns of Fur Dealers Reports.

P.S:—Frank Ashbrook figures are not based on 100 per cent returns and when I sent him the data this fact was mentioned, I would therefore not hesitate to use figures in the above table.

United States are taken each year from the Great Smokies.

Otters, until recently protected by law, are present in practically every part of the state and in coastal wilderness areas they are relatively abundant. Last year more than 800 were taken by trappers. One large male specimen that I handled weighed 24 pounds and measured 47 inches from tip of nose to tip of tail. Its pelt brought the trapper $25 while a mink weighing 2 pounds brought $23. This year, the same sizes in otters and minks are bringing $15 and $13, respectively.

Other members of the weasel family — skunks, civets, weasels—apparently are not present in commercial quantities or could it be their bag of perfume that makes them unpopular?

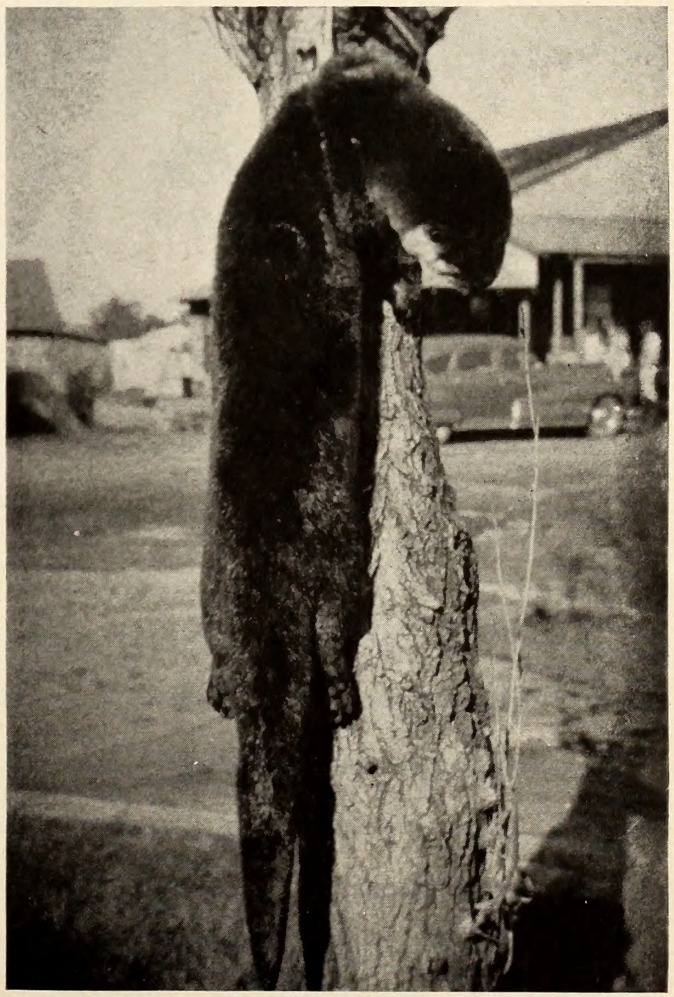
North Carolina also has several colonies of recently stocked beaver in the Sand Hills section of the state that have increased and are in need of redistribution into other non-agricultural areas. When given strict protection this big rodent and important fur bearer will increase surprisingly fast. Though extinct a few years ago in nearly every eastern state today this animal can be found even in the tiny state of Delaware. North Carolina with its many wild areas certainly should offer these animals a future ideal habitat and in time provide another source of income to the trapper.

Each fall and winter approximately 3,000 licensed trappers set traps for the common fur animals in the state. Among these trappers are farm and city youth, 4-H Club boys and Boy Scouts, men, and even women. Though professional 'rat and mink trappers in the northeastern corner of the state occasionally net several thousand dollars during a season, the bulk of the trappers realize returns ranging from a few dollars to several hundred dollars and quite often young men in the community accumulate sufficient fur money to help finance their way through college.

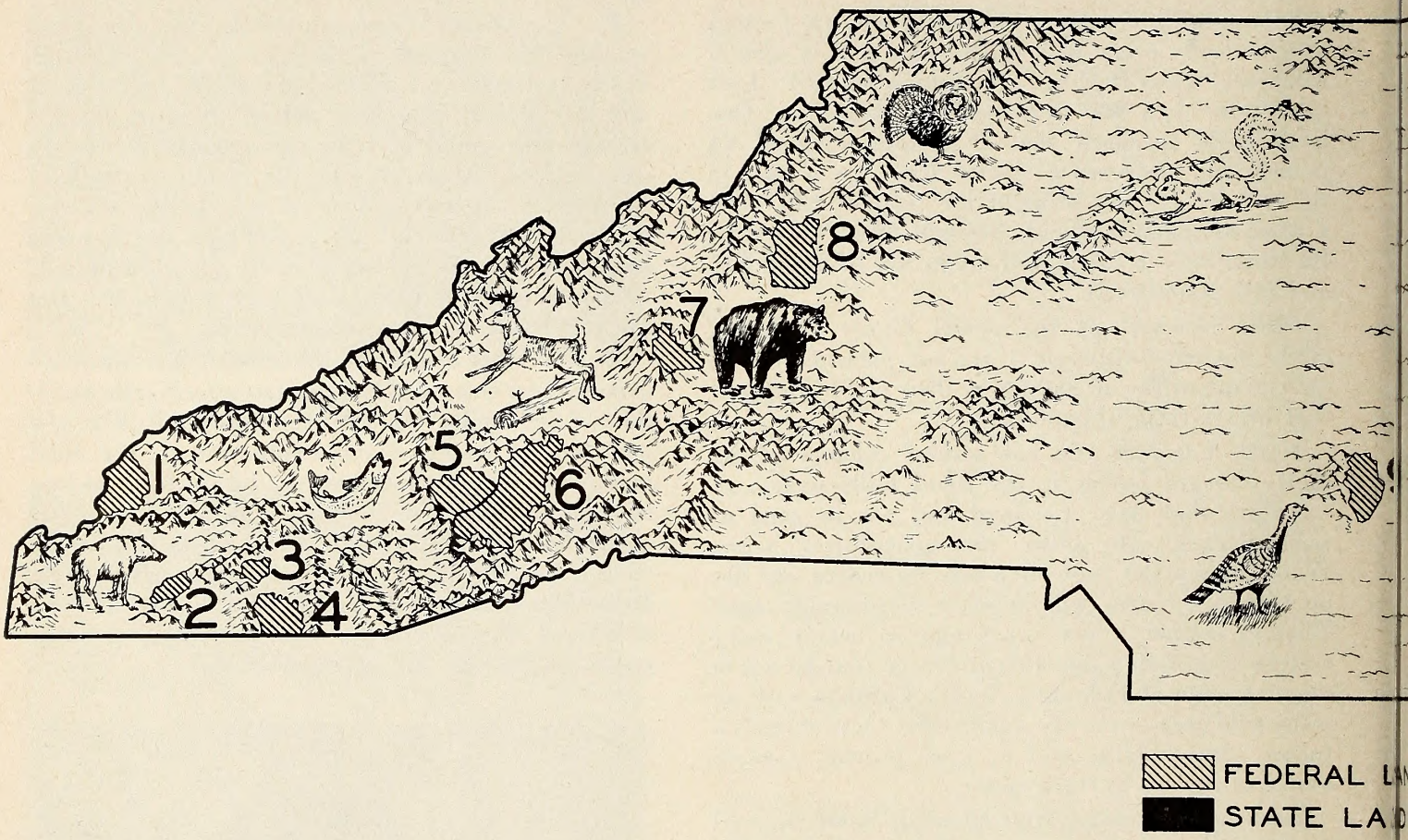
The successful trapper cannot be described as "just lucky." First of all he must be a good woodsman and wise in nature lore. He should know when the fur animals in his locality are primest and trap for them then. He should tend his traps daily and when trapping in water make drowning sets wherever possible. If fox trapping in your section is permissible, don't forget that your prize dirt hole and scent post sets will also take dogs whereas the mound or anthill set will not. And remember, the trapping laws were made to protect your sport, not to confound you, and that the Game Protector in your county is the person on the lookout for the out-of-season trapper and the thief who lifted your traps and stole some of your furs, therefore, he's your friend. As you run your trapline each year, don't forget that words like "conservation" and "fur management" are not only for the other fellow but also for you. Conservation means "to use wisely." Obviously if you overtrap your area or fail to cure (skin, flesh and dry) your pelts for maximum monetary returns you are not using wisely what you have.

Fur management means to the trapper what farm management suggests to the farmer. For example: If the raccoon trapper cut down all the hollow trees and the mink trapper dug out all the dens along a stream, this would be poor management and sorry conservation. Muskrats like the roots of cattails to eat but some ponds and marshes lack this valuable food. By taking cattail spikes and planting the seeds in mud this vegetation can be easily grown to provide abundant muskrat food. And when you do this you are practicing muskrat management.

The Wildlife Resources Commission has not overlooked the value of Fur Resources to North Carolinians and under the Pittman-Robertson Act they now have a biologist on assignment in the tidal marshes of Currituck County to dig up facts on how to condition muskrat habitat for heavier yields and apply the results in practical management over the state. A recently purchased 800 acre Northwest River Marsh near Moyock is the focal point of these investigations and from time to time as progress is made the findings will be reported.



Protection and management have brought back otters as a source of income to Tarheel trappers. They feed on fish almost exclusively, and are not a serious menace to muskrats as many trappers believe. The above specimen weighed 21 pounds.



NORTH CARO
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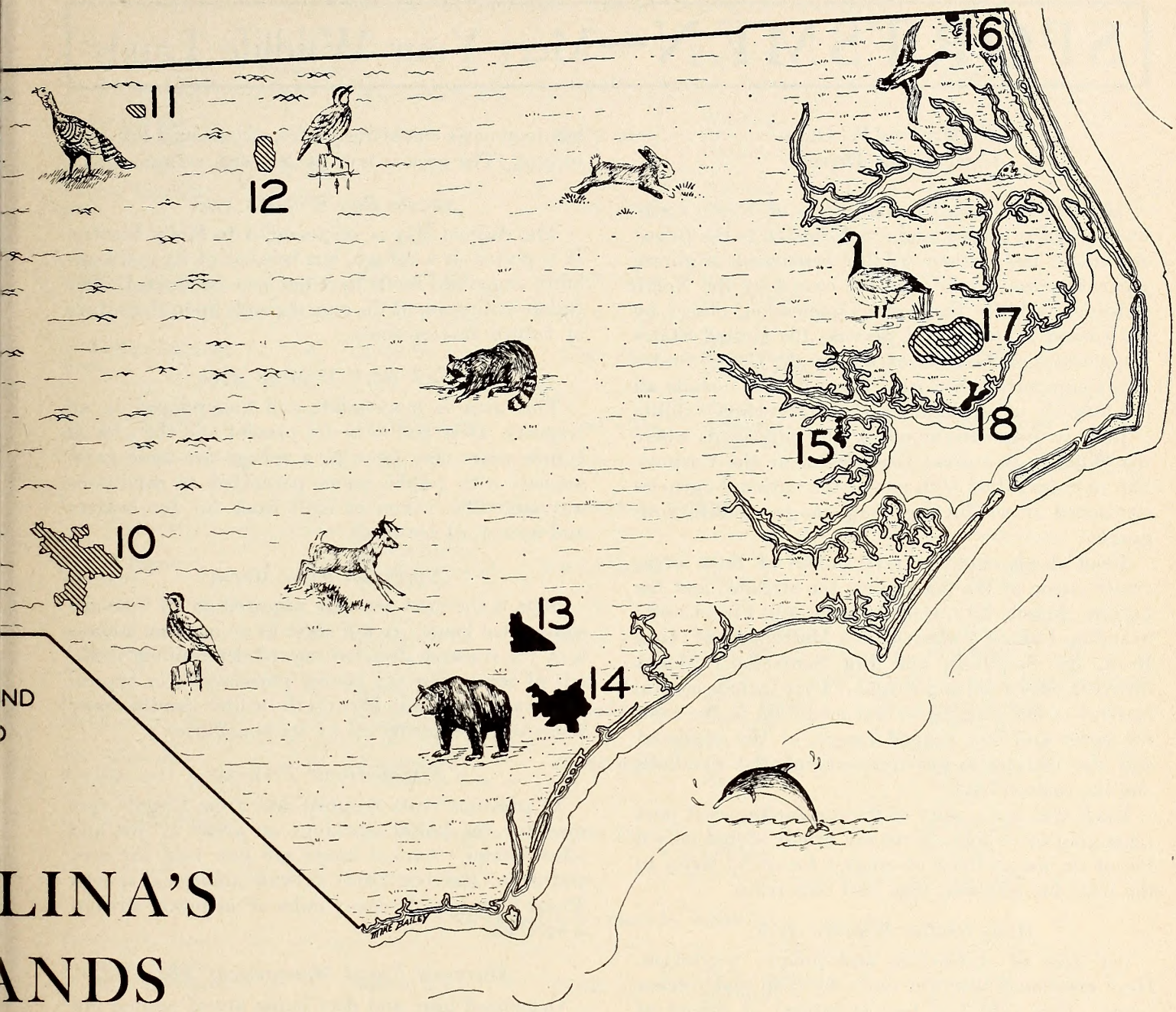
1. Big Santeetlah Wildlife Management Area.
2. Fires Creek Wildlife Management Area.
3. Wayah Bald Wildlife Management Area.
4. Standing Indian Wildlife Management Area.
5. Sherwood Wildlife Management Area.
6. Pisgah Game Preserve.
7. Mount Mitchell Wil
8. Daniel Boone Wildli
9. Uwharrie Wildlife
10. Sandhills Wildlife
11. Caswell County Lar
12. Camp Butner Area



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13. Angola Wildlife Management Area.
14. Holly Shelter Wildlife Management Area.
15. Goose Creek Wildlife Management Area.
16. Northwest River Marsh Area.
17. Lake Mattamuskeet National Waterfowl Refuge.
18. Gull Rock Wildlife Management Area.

SPORTSMEN—Meet Your Wildlife Lands

By Hayden W. Olds
Chief, Game Division

More than one-half million acres of North Carolina's publicly owned land are dedicated to the fullest and wisest use of their wildlife resources. Eighteen separate areas in all, some are owned by the North Carolina Wildlife Resources Commission, others by the United States Forest Service, the United States Department of the Interior, and by the United States Soil Conservation Service. These do not include all the publicly owned lands in the State where wildlife is present in goodly numbers, but only lands where the Wildlife Resources Commission or the Commission in coöperation with one of the national agencies mentioned is conducting long range wildlife programs.

Read slowly and the very names of these areas create music of the mountains, the streams, and the forests. Angola Bay, Daniel Boone, and Fires Creek; Standing Indian, Uwharrie, and Mattamuskeet; Gull Rock, the Sandhills, and Big Santeetlah; Mount Mitchell, Sherwood and Pisgah. They include coastal marshes of the east, the tallest mountain in the west, the lower and less rugged ranges of the piedmont and the distinctive environments of the Sandhills and the eastern bays.

Each area has a story of its own for the most part remaining to be told. Here are briefly stated only a few of the major items of interest for each. Refer to the map for location, size, and ownership.

Holly Shelter Wildlife Area

An area of distinctive and unique vegetation. Here are found the rare venus fly-trap and pitcher plant. This peat bog bay is typical of others of similar nature found in the Eastern Carolinas, supposedly originated by a shower of meteors which fell upon this particular section of the earth many years ago. The bay is poorly drained and during periods of high water wildlife on the area leads a precarious existence. The quality of wildlife food is uncertain, but the supply is plentiful. Annual hunts for deer and bear are held and research is being conducted which it is hoped will determine ways and means of increasing the number and size of deer on Holly Shelter and similar coastal areas.

Goose Creek Wildlife Area

Five tracts of land are involved and additional purchases must be made if the boundaries are to be rounded out and sufficient acreage obtained to make this an important wildlife unit. Possibilities of deer and bear are excellent and fur bearers and waterfowl warrant careful consideration. An annual timber increment would result from continued fire protection. The area is now posted with refuge signs.

Angola Bay Wildlife Area

The Angola Bay is very similar to Holly Shelter. It is posted as a refuge, but because of its inaccessibility organized hunts have not been conducted. The fullest utilization of the area depends upon the nature of future developments.

Gull Rock Wildlife Area

This area is inaccessible and undeveloped in all respects. Deer and bear are present and the area in future years may serve as a refuge for these game animals with public hunts permitted as conditions warrant. The values of Gull Rock for fur bearers and waterfowl are small.

Northwest River Marsh

This is the most recently acquired of all Commission-owned lands. It will serve as an outdoor laboratory for research directed toward determining methods of increasing fur bearer populations in typical freshwater marshes. During the winter months many waterfowl are protected by its boundaries.

Pisgah Game Preserve

In previous years trapped deer from Pisgah were used for the initial stockings on areas in this and other States. Annual hunts are now held for deer and bear. Raccoon hunts provide additional sports. Trout fishing in the many miles of mountain streams is excellent.

Sherwood Forest Management Area

Organized bear and deer hunts are of annual importance. The hunts are held on separate dates and the bear hunts in particular are prized highly by those who are successful in obtaining hunting permits. Trout fishing attracts many visitors during the open season.

Mount Mitchell Wildlife Area

Trout fishing and the hunting of deer are annual events on this beautiful area. The deer now present resulted from stockings made twenty years ago. The Blue Ridge Parkway divides the area and as a result many people other than fishermen and hunters visit the area each year.

Daniel Boone Wildlife Area

This area is an excellent example of what wild-trapped deer released in good environment and given adequate protection will do. Deer have increased here to the extent that a hunt on the area is possible

WILDLIFE MANAGEMENT AREAS IN NORTH CAROLINA

Name	Number of Personnel	Location	Size	Owner	Principle Wildlife
Holly Shelter Wildlife Area	2	Pender Co.	48,470 acres	Wildlife Resources Commission	Deer and Bear
Angola Wildlife Area		Pender Co.	21,134, acres	Wildlife Resources Commission	Deer and Bear
Goose Creek Wildlife Area	0	Beaufort Co.	5,866 acres	Wildlife Resources Commission	Deer
Gull Rock Wildlife Area	0	Hyde Co.	7,500 acres	Wildlife Resources Commission	Deer and Bear
Northwest River Marsh	1	Currituck Co.	793 acres	Wildlife Resources Commission	Muskrats and Waterfowl
PISGAH NATIONAL FOREST					
Pisgah Game Preserve	4	Transylvania, Buncombe, and Henderson Cos.	100,000 acres	U. S. Forest Service	Deer, bear and trout
Sherwood Forest Management Area	2	Haywood Co.	30,875 acres	U. S. Forest Service	Deer, bear and trout
Daniel Boone Management Area	3	Caldwell, Burke and Avery Cos.	46,500 acres	U. S. Forest Service	Deer, bear and trout
Mt. Mitchell Management Area	3	Yancey and McDowell Cos.	25,000 acres	U. S. Forest Service	Deer, bear and trout
Uwharrie Wildlife Area	1	Montgomery Co.	35,588 acres	U. S. Forest Service and Leased	Deer and turkeys
NANTAHALA NATIONAL FOREST					
Standing Indian Wildlife Management Area	1	Macon Co.	28,432 acres	U. S. Forest Service	Deer, bear, turkey and trout
Wayah Bald Wildlife Management Area	1	Macon Co.	11,284 acres	U. S. Forest Service	Deer, bear and trout
Big Santeetlah Wildlife management Area	2	Graham Co.	37,168 acres	U. S. Forest Service	Deer, bear, boar and trout
Fires Creek Wildlife Management Area	1	Clay Co.	13,720 acres	U. S. Forest Service	Deer, bear and trout
Lake Mattamuskeet	1	Hyde Co.	50,000 acres	U. S. Dept. of Interior	Waterfowl, Deer and Fish
Sandhills Area	3	Richmond Scotland Moore	60,000 acres	U. S. Dept. of Interior	Deer, turkey, quail, squirrels, fish
Caswell Co. Land-Use Area	0	Caswell	6,000 acres (Approx.)	U. S. Soil Conservation Service	Turkey, deer and small game

and in addition many deer are also killed on the lands surrounding the management area. Trout fishing is excellent in the clear, cold streams.

Uwharrie Wildlife Area

Here is another splendid example of the success possible through transplanting deer. Although no open season has been declared on the Uwharrie Forest or in Montgomery County such action by the Wildlife Resources Commission is undoubtedly imminent. Part of the forest is also being developed intensively for wild turkey.

Standing Indian Wildlife Area

Wild-trapped deer were released on this area during the period 1937-1940 and again during the winter of 1946-1947. The deer increased due to favorable environment and adequate protection to the point that a public deer hunt was held at Standing Indian during the season just closed. Raccoon hunts have become an annual attraction. A few bear also live on the area. Many people enjoy trout fishing on the streams within its boundaries.

Wayah Bald Wildlife Area

This area serves as refuge to deer and bear in a heavily hunted region. It is not expected that public hunting will be permitted here in the near future. Although somewhat less important than on other Forest Service Areas trout fishing is permitted annually.

Fires Creek Wildlife Area

The goodly population of deer on the Fires Creek Area resulted from previous stocking as on other lands mentioned. This year successful public hunts for deer and raccoon were held. Bear are also common on the area. There are no true Russian boar known to exist on Fires Creek, but wild hogs are very abundant, and a special public hunt was held this year in an effort to reduce their numbers. Fires Creek is a beautiful mountain stream which is heavily fished for trout.

Lake Mattamuskeet National Wildlife Refuge

This area is probably the most famous goose wintering area on the Atlantic flyway. It is estimated that 65,000 geese and 45,000 ducks of miscellaneous species are wintering there during the present season. Public hunting for geese and waterfowl is permitted by means of a well established system of blinds. Many geese are also killed in the surrounding fields where they go to feed. The refuge lands surrounding the lake serve as refuge for a large population of deer. The lake also attracts thousands of fishermen annually.

Big Santeetlah Wildlife Area

Here again the present deer herd resulted from a stocking of wild-trapped deer. A small number of the true Russian boar still live on Big Santeetlah. Annual public hunts are held for bear, and boar and raccoon. Trout fishing is also excellent.

Sandhills Area

It is expected that this area will soon become the property of the North Carolina Wildlife Resources Commission. At the present time some management work is being done under authorization received by the United States Fish and Wildlife Service. Deer, quail, and squirrel are important game species. Intensive development work for wild turkey has been planned and preliminary work started. The only beaver known to be in the State are found here. As yet no public hunts are contemplated, but public fishing is enjoyed in a series of small lakes which dot the area.

Camp Butner Wildlife Area

The North Carolina Wildlife Resources Commission applied for War Surplus Lands to be developed for wildlife purposes at the site of the former Camp Butner Military Reservation. The federal government has ruled that the land in the Camp Butner area is "chiefly valuable for agricultural purposes" and has turned the tract over to the Farm Credit Administration for disposal to agricultural interests.

A number of deer were stocked on the area during the winter of 1945-1946. There are excellent locations for the construction of small lakes.

Caswell County Land-Use Area

This tract has been leased specifically for the purpose of wild turkey management. It includes for the most part United States Soil Conservation Service lands, the boundaries of which have been rounded out by securing leases on private land.

Intensive wildlife turkey development are planned. Deer and small game will also benefit.

THE GRAY SQUIRREL

(Continued from page six)

Added to this is the phenomenon of mass migrations which can effect a complete lack of gray squirrels in certain localities.

In view of fecundity and local or regional population variations, control of the annual harvest is the most effective management practice. The same forestry practices which increase and sustain the forest owners' income serve to benefit squirrel populations. Laws and regulations have been formulated to prohibit the cutting of den trees which serve as winter homes for the species.

Clear cutting of hardwood forests destroys valuable squirrel habitat, while reforestation and hardwood forest management serve to improve it.

The intelligent setting of shooting seasons must always reckon with the breeding habits of the species

(Continued on page twenty-one)

The Hiwassee Dam forms one of many TVA impoundments which add beauty to the countryside and provide recreation and sport for thousands.

THE FISHERIES SITUATION ON TVA IMPOUNDMENTS (Part II)

By R. W. Eschmeyer
Tennessee Valley Authority Norris, Tennessee
Presented to Conservation Conference, U. S. Corps of Engineers at Cincinnati, Ohio, February 19, 1948.

At a time when it was becoming increasingly difficult to meet the fishing demand in most areas, TVA asked state fisheries authorities to discard the closed season on TVA waters as an experiment. We have shown little interest in size limits, and have stressed repeatedly that most fish of desirable size and species, in TVA waters, never sample an angler's lure. If anglers and fish conservationists are showing more than casual interest in the TVA fisheries investigation program, this, too, is understandable.

The fisheries picture on TVA impoundments can be reviewed only very briefly here. The discussion is limited to a few of the major observations. It should be understood that impoundments differ and that the findings on TVA waters do not necessarily apply elsewhere. Too, our information is limited to past and present fish conditions. We make no predictions as to what the fisheries picture will be like ten or fifty years from now.

TVA waters now include 26 reservoirs having an area of about 600,000 acres, and a shoreline of some 10,000 miles. Fisheries investigations have been con-

ducted most extensively on two reservoirs—Norris, oldest TVA-built storage reservoir, and Wheeler, oldest TVA-built mainstream reservoir. These two waters serve as "test" reservoirs; information gathered there is applied to the others.

It should be stated that the two kinds of reservoirs differ greatly. The nine mainstream waters, impoundments of the Tennessee between Knoxville and Paducah, retain river characteristics; there is little if any oxygen and temperature stratification. On the other hand, storage waters more nearly resemble natural lakes in stratification. Navigation must be maintained on the former so there is only limited winter drawdown. Storage waters are drawn down many feet each winter for flood control. Investigations show that fish conditions differ rather widely in the two types of water.

Here are a few pertinent observations:

Increase in Fishing. Among the early investigations was a study to note changes in fishing brought about by impoundment. This study suggests that fishing on the storage reservoirs increased 45 to 50-fold (not per cent) over fishing on the streams before the dams were built. On the mainstream reservoirs the increase was 10 to 15-fold. With year-round fishing the angling pressure has almost doubled, everywhere except in Alabama waters where year-round fishing for most species has been permitted since impoundment. This means that impoundment has increased fishing nearly a hundred-fold on storage waters, and perhaps 25-fold on mainstream waters outside of Alabama.

Extent of Angling. Fishermen counts show that Norris supported about 4 fishing trips per acre in 1944. The tailwaters (waters immediately below the dams) on the Tennessee supported an estimated 393,000 fishing trips in the 1947 fiscal year. Four mainstream reservoirs combined had an estimated average of 5 trips per acre in 1940, exclusive of fishing on tailwaters.

This information is admittedly too inadequate to permit a close estimate of total fishing, but reducing the numbers to 3 individual trips per acre on storage waters, and 2 on the mainstream, should provide a very conservative estimate. On this basis the 148,739 acres of storage water support about 450,000 individual trips annually, the tailwaters another 450,000 and the 447,450 acres of mainstream water about 890,000. The estimate of fishing on all TVA waters, admittedly rough but still conservative, is about 1 ¾ million individual trips per year.

In 1944 the catch on Norris averaged close to 13 pounds per acre. In the Guntersville Dam tailwater the catch during the 1947 fiscal year was 4.5 pounds per trip. On several mainstream waters the estimated take per trip in 1940 was as follows: Guntersville, 2.2 pounds; Wheeler, 2.8 pounds; Wilson, 2.6 pounds; and Pickwick, 2.3 pounds.

Estimated at 10 pounds yield per acre the storage waters yield 1½ million pounds annually. At 4 pounds per trip, the tailwaters yield 1¾ million pounds. At 2 pounds per trip, the mainstream waters yield 1¾ million pounds. Again these are rough estimates but if they are in error the error is on the conservative side. The total catch for all TVA waters probably exceeds the estimated 5 million pounds per year.

Trends in Fishing. Fishing appears to be improving in terms of average number of fish caught per trip. On seven waters (four storage, two mainstream, on tailwater) where a creel census has been taken for three successive springs, the catch from April 1 to May 15 was greatest the third season (1947) at three locations, the second season at one, and the first season at three. For all waters combined, fishing was definitely better in 1947 than in any previous year.

On Cherokee in early 1947, with an estimated three-fold increase in fishing over 1945, the number of fish caught per trip also increased almost three-fold.

All information on fishing to date suggests that angling has greatly increased on the Tennessee and its tributaries since these waters were impounded. There is still no evidence that they are becoming "biological deserts."

The Closed Season. The closed season has now been discontinued for four years on several reservoirs and for three years on most of the other TVA impoundments. It was discontinued (by the Tennessee Conservation Department) on Norris Reservoir as a result of certain findings: (1) Norris Reservoir was well supplied with bass and other game fish. (2) Only a small percentage of these very desirable fish was being harvested. (3) The sudden decline in fishing soon after the opening of the season coincided with a change in game-fish feeding (from 1-year-old shad and crappie to the very abundant young-of-the-year fish). (4) The depth distribution of fish, largely determined by water temperature, covered a wide range in the fall; the fish were not concentrated at any one depth. (5) In winter few game fish were active; those that were (sauger and walleye) could not be readily caught, probably because the low temperature slowed up their digestive processes. (6) Even though the fishing season was open for two consecutive seasons when spawning was at its height, a good crop of young game fish nevertheless resulted.

In short, we found that most game fish were not taken, that adequate harvesting was not possible by summer, fall, and winter fishing alone, and that fishing during the spawning season did not prevent successful reproduction in this reservoir. We found out too, from growth studies, that these very fast-growing fish did not live as long as their slow-growing relatives in less suitable waters, or in northern waters where the growing season is shorter.

On all but two TVA waters the closed season was discontinued early in 1945; since then all have been

open to year-round fishing. Some have interpreted this to mean that fishing is good "the year round." That, of course, is not so.

Extensive creel census studies made since the closed season was discontinued have revealed no general decline in fishing. Tagging studies still show that most fish are not caught even with year-round fishing. All evidence to date suggests that this change in regulation, which greatly increased the catch, and which is valued at several million dollars per year in added business generated (boats, motors, tackle, etc.), has no harmful effect on the fishery.

Extent of Harvesting. Numerous tagging studies have been made and all tell the same story—inadequate harvesting. Of 1,443 fish of various species tagged early in 1947, 120 had been reported recaptured by November 24. Of 1,000 adult crappie tagged in Wheeler Reservoir in 1946, 13 have been retaken; of a similar number tagged in 1947, 15 were reported retaken by November 15. To minimize injury, all tagging is done in winter and spring when the water is cool. Evidence collected in 1940 suggests that no appreciable mortality results from the tagging operations.

Spawning Success. In normal operation, the mainstream reservoirs are full and at constant level at spawning time; storage waters are rising slowly. Frequent population studies have revealed good reproduction of game fish in both types of reservoirs.

In 1947, with a heavy demand for electric power and with abnormally low rainfall, there was a slow decline in water level at spawning time on some storage waters. Even under these conditions there was good reproduction.

The Winter Drawdown. Though contrary to all expectation, the winter drawdown for flood control appears to be advantageous to game fish. It apparently does not interfere with their reproduction and survival. It does, however, interfere with the well-being of rough fish.

Because of the drawdown, the bottom feeders (carp, buffalo, adult shad) have little food. Inquiries on Norris Reservoir for several years showed most carp in poor condition. Most of the females examined failed to spawn even though their eggs seemed to have developed normally.

The several permanent-level pools on TVA impoundments have provided poorer fishing than have the reservoirs proper. One such pool on Norris Reservoir, when examined, could support fish only in the upper fifteen feet because of stagnation. A 68-acre pond at the head of Chickamauga Reservoir contained about 19,000 pounds of fish two years after original impoundment. Nearly 18,000 pounds were rough fish; game and pan fish comprised only 1,235 pounds.

The winter drawdown apparently limits the abundance of rough fish (by limiting their good), without seriously injuring the game fish population.

The drawdown, of course, does interfere somewhat with boating. It certainly contributes nothing to the scenic beauty of the impoundments.

The Rough Fish Problem. There is no rough fish problem on TVA storage waters, presumably for the reasons just mentioned. Some rough fish are present but they are not abundant—and they are becoming less abundant with each year of impoundment.

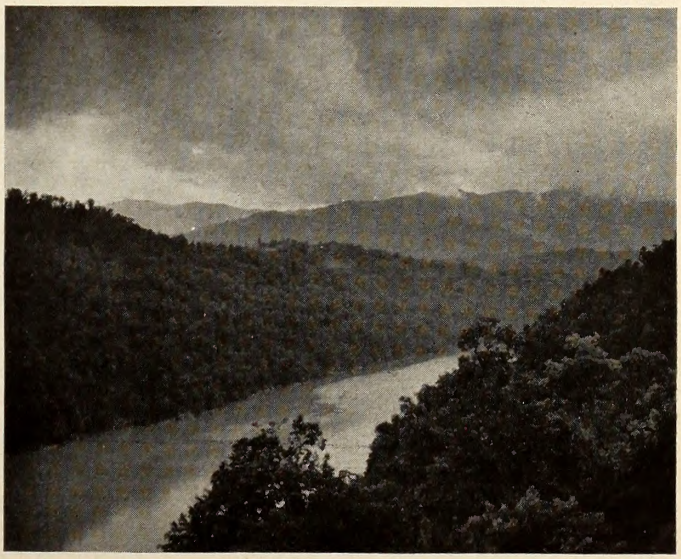
These species are much more abundant on the mainstream reservoirs (where drawdown is limited to a few feet) but studies suggest that they are also decreasing here. The low transparency of the water in mainstream reservoirs can probably be attributed to the bottom feeding of the rough fish. In general, these reservoirs are less clear than the storage waters.

Commercial Fishing. Commercial fishing is not included in the estimates above, or in the discussion to follow. This type of fishing is chiefly with snaglines for catfish and spoonbill, though there is also some netting and trotline fishing. It is limited almost entirely to the mainstream waters. Fish reported purchased by buyers during the 1947 fiscal year totalled 1,550 pounds and was valued at $298,000. These figures do not include sales by the fishermen direct to the consumer.

The Food Chain. Food studies on Norris indicate that the gizzard shad is the chief factor in the food chain—in fact, fishing in TVA storage waters would probably be poor if this species were not present. The major food chain is plankton—shad—game fish. This requires no coarse aquatic vegetation and does not call for constant water level. Insects are scarce in waters having extensive drawdown. Insect-eaters, such as the bluegill, grow slowly; fish-eaters grow rapidly.

Small bluegills are a very significant item in the food of young-of-the-year bass.

Since good items like insects, crayfish, and snails are scarce, adult fish must subsist on other fish (or plankton). For this reason some species are taken



Many TVA impoundments form long, narrow channels which wind among mountain scenes.

on plugs more often than might be expected. Norris Reservoir drum are taken extensively on these baits in the fall. Channel catfish are also taken on plugs. Even an occasional carp is caught on this type of bait.

Harvestability of Species. It is well known that brown trout are less easily harvested than brook trout, but the question of "harvestability" of warm-water fish has received little attention. According to the returns from tagging, walleye are much more difficult to harvest than largemouth bass. Population studies show a much higher percentage of smallmouth bass in the fish population than in the black bass catch. The largemouth bass and the black crappie are probably the most easily harvested of the game and pan fish on storage waters—the largemouth because it tends to be concentrated in shallow water in spring; the black crappie because it can be concentrated by use of fish shelters.

Vegetation. There is no aquatic vegetation in storage waters because of the drawdown. Its absence does not appear to limit the game fish population. Some aquatics are present in those mainstream reservoirs where the drawdown is limited to a very few feet.

Depth Distribution. Inquiries show that the fish tend to be distributed over a wide range in depth. Temperature appears to be the major contributing factor. On storage waters, species like the largemouth bass, which tend to be in shallow water in spring, may be distributed more or less evenly through the upper 50 or 70 feet in fall. Walleye have a wide distribution at all times. No fish distributed over a wide range of depth is easy to harvest.

On Wheeler Reservoir (mainstream) where temperatures are more uniform from top to bottom, the white crappie tend to be in the shallow backwaters in spring; in summer they appear to be most abundant at depths of about 15 feet.

Growth of Fishes. Growth of Norris Reservoir fish has been studied for the first 10 years of impoundment. There was a slight decline in growth after the first few years but the rate of growth has continued rapid. Largemouth bass reach legal size (10 inches) early in their second year; spotted bass grow to legal size in two full years; smallmouth bass are legal size in two and a fraction years. Although growth of game fish has not been studied extensively on waters other than Norris, it appears to be fairly rapid on most TVA impoundments.

Stocking. Most fisheries workers seem to agree that the benefits of stocking large bodies of water with warm-water fish are mostly, if not entirely, psychological. Our experience on TVA waters fails to prove otherwise. Even during the first year of impoundment large crops of young are produced naturally. The young fish produced by the brood stock present in the original stream have few enemies the first year. Survival is exceptionally good. Though no careful study has been made of the first year reproduction, unstocked waters apparently were as well supplied with fish as were those which had artificial stocking.

Stockings to introduce new species in several TVA storage reservoirs has been successful.

Trout Possibilities. Trout were naturally present in several of the impoundments and have been introduced in one or two others. But as yet there is no extensive trout fishery in any TVA reservoir.

Since completion of Fontana Dam, the water in the Little Tennessee River below that dam has become cold. Investigations now in progress suggest that this river, one of the bigger streams in the Tennessee Valley, has possibilities of becoming a trout stream.

The North Carolina Wildlife Resources Commission plans experimental stocking of lake trout in several TVA impoundments. We cannot say, at present, whether or not a trout fishery will develop, but some of the reservoirs (at higher elevations) have strata which seem well suited to trout insofar as oxygen and temperature are concerned.

Time of Harvesting. On Norris Reservoir fishing is best in spring—between the time the water warms to 60 degrees and the time young-of-the-year fish are about an inch long. Until the water temperature reaches 60 degrees the fish are too inactive to be taken readily on artificial bait. When the young reach a length of an inch or so, they provide a plentiful food supply for adult game fish. The lures offered by the angler just don't stand a chance.

General Considerations

We need hardly mention that our findings and observations differ considerably from what had been expected. The "biological deserts" have not developed yet. What the future holds is unpredictable. Be that as it may, we can certainly take a more optimistic view of fishing on impoundments than we once did.

Though I cannot comment on fishing possibilities of the numerous impoundments being built by the Corps of Engineers, I offer the following observations for consideration:

1. The fisheries aspects of impoundments should be regarded as having more than ordinary significance.
2. These waters may greatly improve general fishing conditions if they are managed partly for angling.
3. We still know too little about management on reservoirs. More fisheries research is obviously needed. It should be encouraged.
4. At present, erosion control is the most important fish management tool at our disposal. Eventually we will find the answers to most fish management problems. But if the reservoirs have filled with silt in the meantime, the information will be of no value.

Viewing the fisheries picture as a whole, therefore, erosion control should have first consideration, with fisheries investigation next in importance.

WESTERN CLUB TO HOLD FIELD TRIALS IN HENDERSON COUNTY

Beagle enthusiasts in Western North Carolina will be interested in the Beagle field trials sponsored by the Western Carolina Beagle Club on March 28 and 29. The trials will be held on the club's 1,500-acre running grounds just west of Fletcher, N. C., in Henderson County, on what is known as the Westfelt and Sales farms.

The thirteen-inch class trials will be run on March 28, and the fifteen-inch class on March 29. The March trials of the Carolina Beagle Club will include only dogs whelped since January 1, 1948. Trials for all-age classes will be held next October.

The Western Carolina Club has imported three dozen rabbits from Missouri for use at the March Derbys. Persons interested in obtaining more specific information regarding the trials may write to Mr. Arnold R. Phillips in care of the Community Coal and Lumber Co., Asheville. WILDLIFE IN NORTH CAROLINA will have a representative at the event to get pictures and a story for a future issue.

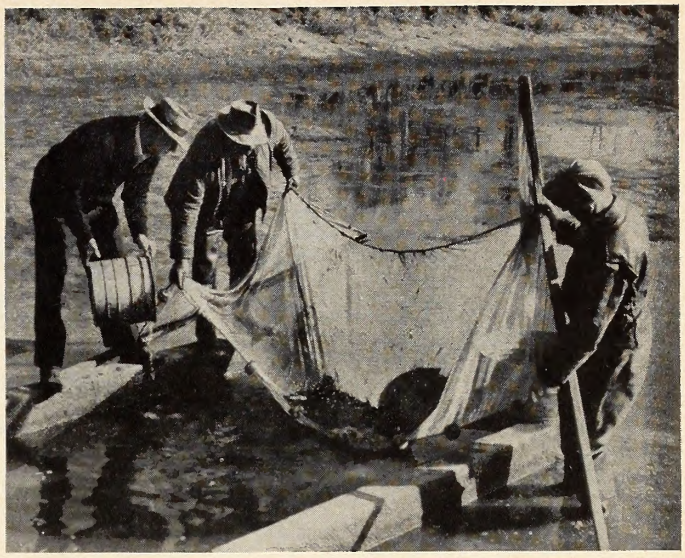
CHOWAN COUNTY CLUB HELPS STOCK BLUEGILLS

Action Photos of Stocking Many Thousands of Bluegills in Pembroke Creek are Shown at Right.

THE GRAY SQUIRREL

(Continued from page sixteen)

concerned. At the present writing very little factual data is available as to the duration of the breeding season from a state-wide point of view. Two types of squirrel hunters further complicate the problem. "Still" hunters, who like to take a stand in the woods and wait for squirrels to appear, demand an early season so that their activities may benefit by heavy foliage on the trees. Hunters who like to use dogs prefer a late season when the leaves are fallen and the squirrels may be seen in the trees once the dogs have treed them. It is obvious that a season set too early might result in orphaned young dying of starvation, and the same thing occurring at the end of a late season. It will be necessary to establish the limits of the breeding season on a state-wide basis, and then set the season to the best interest of the species.



Bluegills being taken from Federal Hatchery at Edenton, for stocking by coöperation with the Chowan County Wildlife Club.

Bluegills are weighed and placed 10,000 per carrying can to be transported to their new home.

Rodney Bunch (extreme right), President of the Chowan County Wildlife Club is assisted by County Commission Chairman W. W. Byrum, and Judge Marvin Wilson, President of Edenton Chamber of Commerce, in stocking historic Pembroke Creek with bluegills.
(Photos by Peter Carlton, Edenton, Photo-Journalist.)

GET IT OFF YOUR CHEST!

EDITORIAL COMMENT, LETTERS TO THE EDITOR AND ANECDOTES

Conducted by Win Donat

In the December, 1948, issue we did a little justifiable crowing over the fact that all of the questions used on this page came in by direct correspondence. As usually happens in such cases, Fate stepped in and made it necessary to repeat our pleas for more reader response. This magazine is devoted to you and your interests and is committed to serving those interests in every possible way. Therefore, we take your questions about hunting and fishing as an evidence of your interest in and appreciation of our efforts. How about it Folks—let's hear from you. Address your communications direct to the editor of this page.

Win Donat.

Q. Mr. J. B. F. of Siler City, North Carolina, asks, "If the eggs found in fish in the fall are an indication that the fish are about to spawn?"

A. This is not a true indication as some fish are false spawners and it is often possible to take a fish in the fall which has every indication that it is about to spawn. Most of our fish spawn in the spring.

Q. Mr. R. M., Jr., of Marion, North Carolina, puts his finger on a sore spot when he wants to know . . . "if it is legal to trap rabbits the year round in North Carolina."

A. Sadly but truly enough, it is permissible to box trap or hunt rabbits without guns all year in North Carolina. We have a long way to go in establishing in the minds of our people the idea that all game must be viewed from the amount of sport it provides rather than the amount of meat.

Q. Mrs. R. L. L. of Raleigh, North Carolina, asks the question which must have concerned many housewives at one time or another. She asks, "Does the food that fish eat effect the flavor of their flesh?"

A. The answer is yes, as it is quite true that the finest game fish such as the smallmouth bass, which normally inhabits clear, cold streams and lakes, may at some time have the muddy objectionable flavor often found in the largemouth. This occurs when the fish feeds on aquatic organisms called algae, usually found in the beds of the streams.

Q. Here is one that may surprise some folks. B. V. T. of Fayetteville, North Carolina, asks, "If there are any beaver in North Carolina?"

A. There are some beavers in North Carolina! Not many, not even enough to trap, but beaver damage caused by the water impounded by their dams backing over roads has been reported. Under care and protection we may some day see this valuable species restored to the point where it may again be numerous enough to harvest.

Q. Mr. D. W. A. of Chicago, Illinois, asks this one which we consider important to all hunters and sportsmen. He asks, "What do we mean when we speak of the shocking power of a bullet?"

A. Reduced to fundamentals, this term describes the effectiveness with which a bullet reduces a piece of game to possession, or produces a clean kill. For example, a .22 is not recommended as a good deer load because of its low shocking power. Admittedly the small bullet might kill the deer, but the animal very probably will not drop near enough to the hunter to give him possession. The sportsman's answer to this question is to use the proper load for the job to be done.

Q. Mr. F. D. K. of Raleigh, North Carolina, wants to know "What is the fastest flying bird in the world?"

A. All that we have been able to learn points to the members of the hummingbird family as the fastest birds, although their top speed is maintained for

very short periods of time. The top speed of a stooping falcon might, in some cases, exceed the speed of the hummers.

Q. Here's one that should be of interest. Mr. M. C. M. of Williamston, North Carolina, asks, "Are shad and herring considered game fish in inland waters?"

A. The answer is that these are not considered to be game fish in inland waters even though the Wildlife Resources Commission has jurisdiction over them while in such waters. Shad fishing on light tackle and with artificial bait is developing and it is quite possible that this fish could acquire such a status.

Q. "What is a coypu and does it occur in North Carolina?" This one from Mr. L. B. R. of Lumberton, North Carolina.

A. The coypu is a marsh animal, living in conditions similar to those of the muskrat. It is properly called nutria and the dressed fur from the animal might be recognized by that name. Coypus, or nutria are considerably larger in size than the muskrat and not as large as the beaver, and are able to adapt themselves to warmer climates than either of these animals. Coypus are large rat-like animals native to South America, and are not a desirable species under most North American conditions.

There are about 20,000 species of birds in the world, about 800 of them being in the United States.

The sassafras tree bears leaves in three different shapes.

CLUB SUBSCRIPTIONS

HERE IS A PROPOSITION FOR THE BENEFIT OF ORGANIZED SPORTSMEN

"Wildlife in North Carolina" Makes a Special Price on Subscriptions in Groups of 25 or More

When submitted in groups of 25 or more, subscriptions to WILDLIFE IN NORTH CAROLINA may be had at a saving of 20 per cent. This means that instead of the regular price of 50c per year or $1.00 for two years, subscriptions will cost 40c per year or 80c for two years.

Members of sportsmen's organizations subscribing in groups of at least 25 may take benefit of the saving individually, or pay the full amount and allow the 20 per cent discount to go into the club treasury.

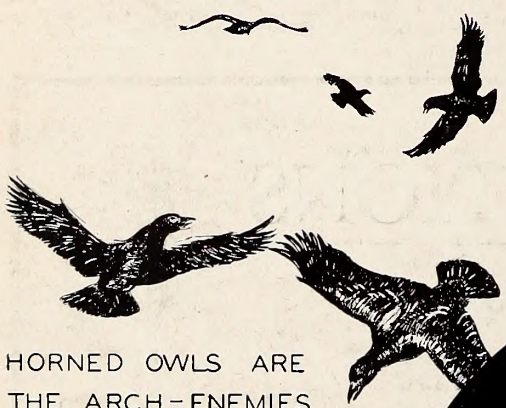
Several clubs have collected the full amount for subscriptions and used the 20 per cent savings to buy gift subscriptions for schools in their county.

THIS PROPOSITION IS WORTH DISCUSSING AT YOUR NEXT CLUB MEETING

STATE LIBRARY OF NORTH CAROLINA
3 3091 00733 1150

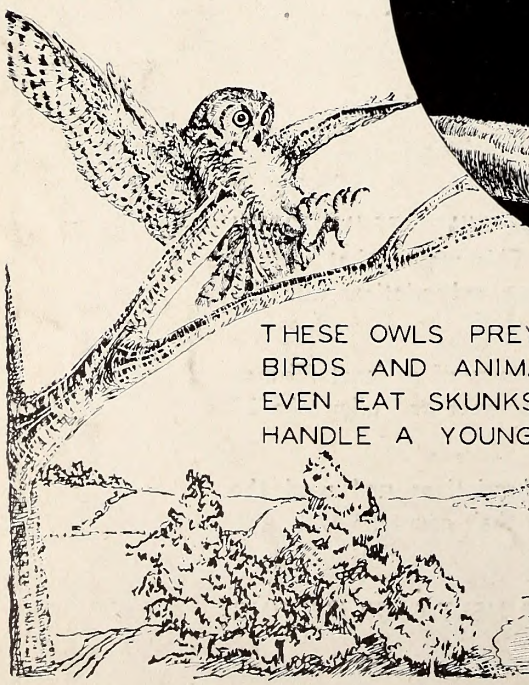
THE GREAT HORNED OWL—

OR HOOT OWL IS OUR FIERCEST WINGED PREDATOR AND IS WELL DISTRIBUTED THROUGHOUT THE STATE – THESE OWLS HUNT EARLY AND LATE IN THE DAY AND OFTEN KILL NEEDLESSLY – POULTRY AND GAME OFTEN SUFFER FROM THEIR RAIDS

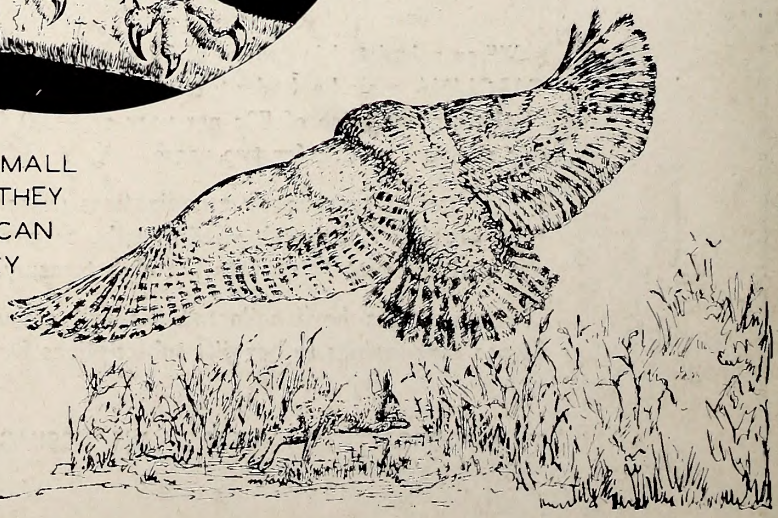


HORNED OWLS ARE THE ARCH-ENEMIES OF CROWS AND A STUFFED OWL PLACED WHERE CROWS CAN SEE IT MAKES A GOOD DECOY FOR CROW HUNTERS

USUALLY TWO EGGS ARE LAID LATE IN DECEMBER OR JANUARY THE YOUNG CAN FLY IN ABOUT SIX WEEKS ONLY THEIR SMALL NUMBERS KEEPS THEM FROM BEING A SERIOUS MENACE TO GAME



THESE OWLS PREY ON SMALL BIRDS AND ANIMALS – THEY EVEN EAT SKUNKS AND CAN HANDLE A YOUNG TURKEY



WIN DONAT